

# HOLEY LAND

## SUMMARY

## MAP

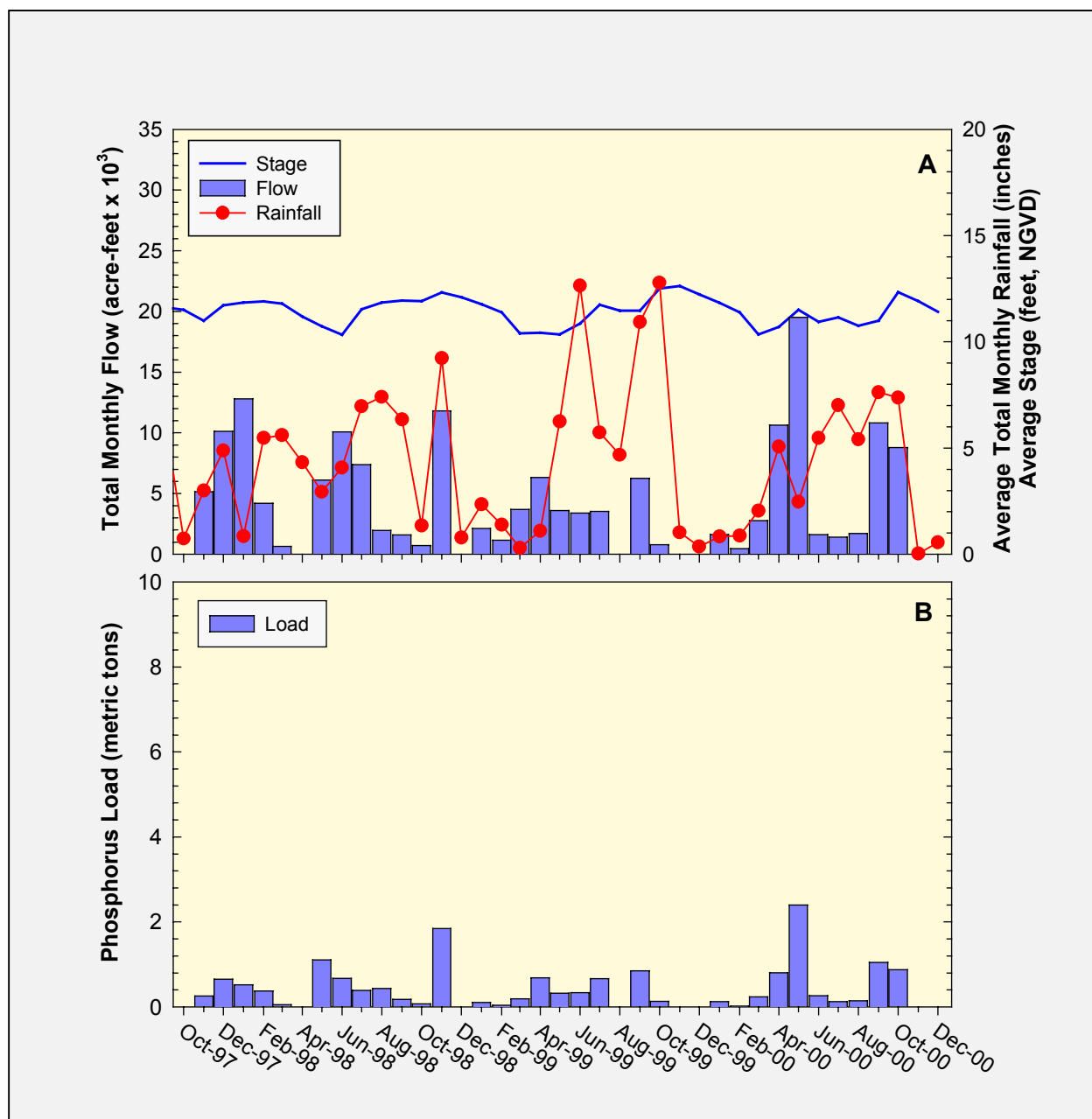
The Holey Land Management Area (Holey Land) is a 35,000-acre tract of land that is operated as a wildlife management area by the Florida Fish and Wildlife Conservation Commission (FFWCC). A Memorandum of Agreement between the Florida Department of Environmental Protection (FDEP), the Board of Trustees of the Internal Improvement Trust Fund, the FFWCC and the South Florida Water Management District established an environmental restoration plan for the Holey Land. As part of the restoration plan, water quality monitoring was implemented to meet the requirements of FDEP Permit No. 06-500809209.

Water quality monitoring is conducted at six surface water inflow and outflow structures as shown in the map ([click link above to view map](#)). Nutrient inputs to the Holey Land can occur through surface water inflows from the Miami Canal (G200) and seepage return pumps (G200SD and G201).

## Hydrology

The restoration effort also includes an operational schedule for maintaining surface water levels within the Holey Land. During the wet season from May 15 through October 31, the schedule rises linearly from approximately 10.5 feet National Geodetic Vertical Datum (NGVD) to 12 feet NGVD. During the dry season from November 1 through May 14, the schedule declines linearly from 12 feet NGVD to 10.5 feet NGVD. During wet years when sufficient rainfall can maintain the stage according to schedule, less surface water inflow from the Miami Canal is required. The restoration plan requires the outflow structures (G204, G205 and G206) to be closed. However, unregulated flows from the outflow structures occur through seepage.

**Figure 22a** demonstrates the relationship between rainfall, stage and inflows at G200 for the period from October 1997 through December 2000. In October 2000, a poorly organized subtropical disturbance passed through south Florida and deposited approximately 7.3 inches of rain in the Holey Land during the first week of the month.



**Figure 22.** **a.** Flow, rainfall and stage measured at inflow station G200.  
**b.** Phosphorus loads discharged into the Holey Land at inflow station G200.

## Phosphorus Loads

Monthly phosphorus loads calculated for inflow site G200 are presented in **Figure 22b**. During the fourth quarter of 2000, 0.9 metric tons of phosphorus entered the Holey Land through G200. Phosphorus loads for October, November and December were 0.9, 0.001 and 0 metric tons, respectively. The highest phosphorus load for this period was observed in October and coincides with the high rainfall and resulting inflow from the subtropical disturbance.

The monthly load of phosphorus from October 1997 through December 2000 averaged approximately 0.4 metric tons. (**Figure 22b**). As a result of the rainfall from the October storm, approximately six times more phosphorus entered the Holey Land through G200 during the fourth quarter of 2000 than during the same period in 1999.

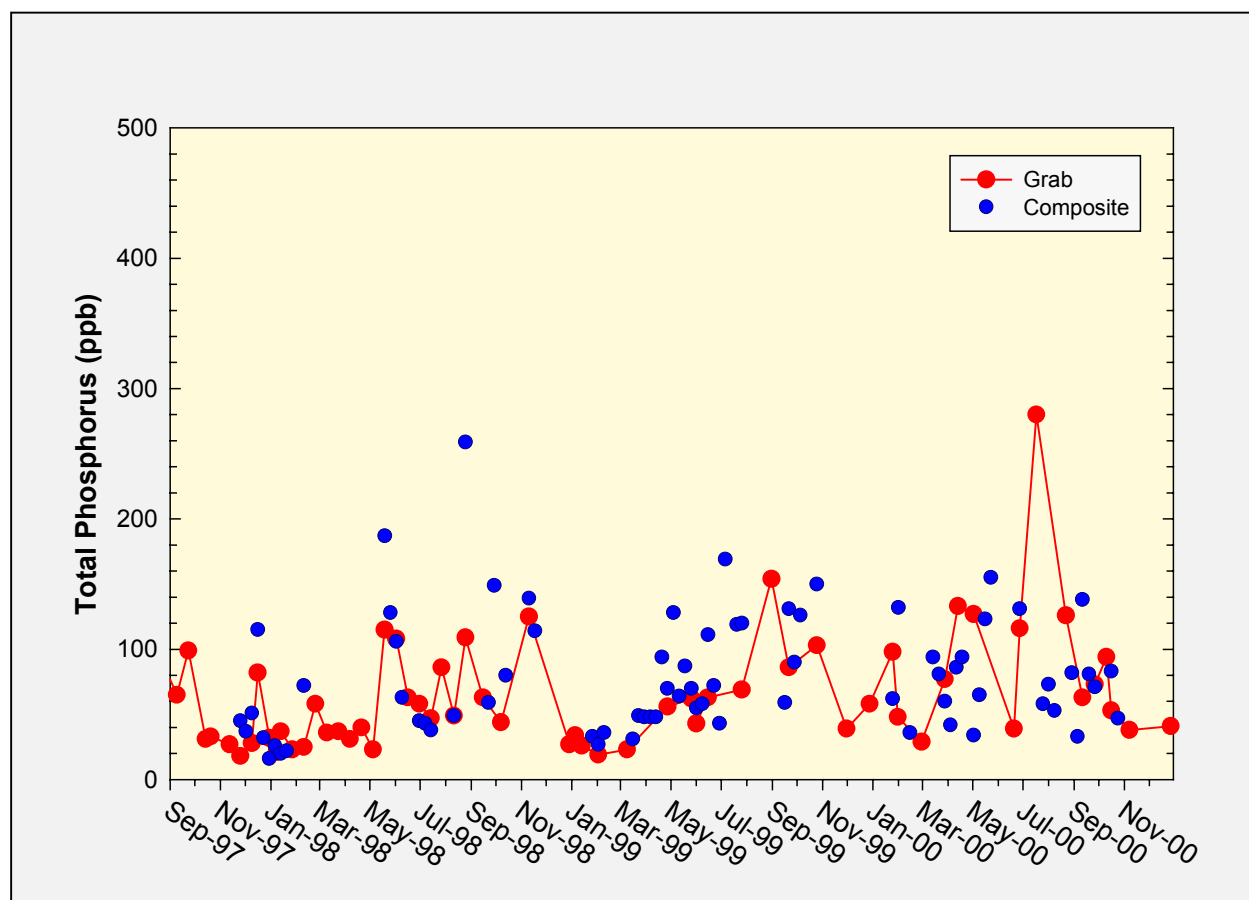
## Phosphorus Concentrations

**Figure 23** displays total phosphorus concentrations from October 1997 through December 2000 collected by grab and composite sampling at inflow station G200. Grab samples have been collected since July 1989, while composite samples have been collected since March 1996.

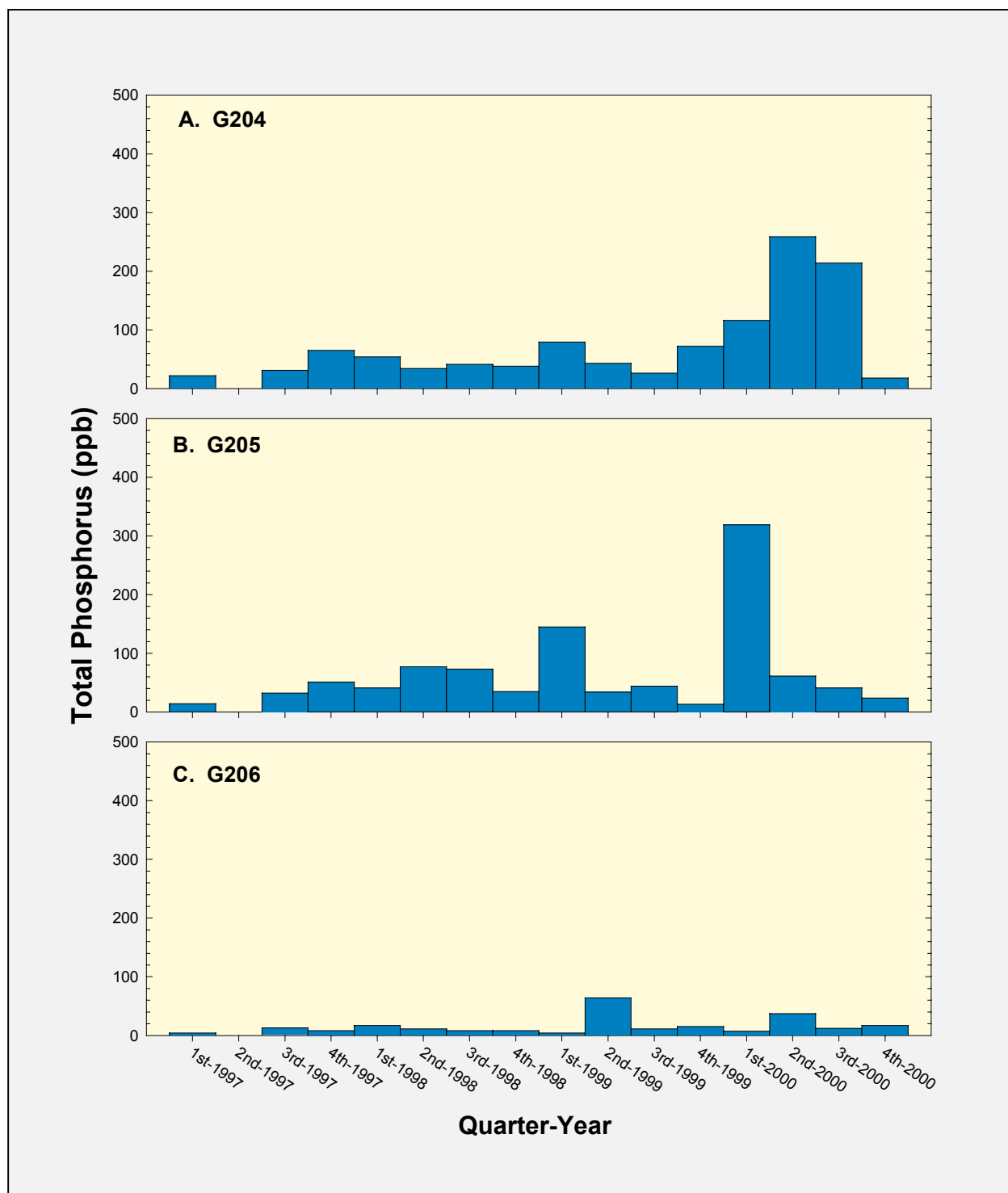
The total phosphorus concentration for grab samples collected at G200 from October 1997 through December 2000 averaged 63 parts per billion (ppb). In comparison, composite samples averaged of 79 ppb.

During the fourth quarter of 2000, total phosphorus concentrations averaged 57 ppb for grab samples and 65 ppb in composite samples.

**Figure 24** provides the quarterly total phosphorus at concentration outflow stations G204, G205 and G206 collected by grab sample from 1997 through 2000. During the fourth quarter of 2000, no gradient in the total phosphorus concentration was evident for the three outflow stations. Historically, phosphorus concentrations at G204 and G205 have averaged approximately 62 ppb compared to 14 ppb at G206. The lower total phosphorus concentrations reported for G206 might result from dilution with water from the adjacent seepage canal where the phosphorus content is lower than in the management area. The canal water is pumped into the Holey Land from seepage return pump stations G200SD and G201. Total phosphorus concentrations measured at G201 and G200SD averaged 10 ppb and 15 ppb, respectively.



**Figure 23.** Total phosphorus concentrations from grab and composite samples collected at G200.



**Figure 24.** Quarterly total phosphorus concentrations measured for grab samples collected at outflow stations a. G204, b. G205 and c. G206.